

Supplemental Material 1: Go-Along Interview Guide

I. INTRODUCTION

I want to thank you for taking your time to meet with me today.

My name is _____. I am working with the Kenya Medical Research Institute on a project aiming to learn about experiences with water access and use and how those might impact maternal and infant health. The purpose of the study is to identify mechanisms by which problems with water might impact a mother's health or her ability to care for her infant. Everything you share during this interview will be kept confidential and will not be shared with your partner, family or community members afterwards. The information that you provide will be used to inform efforts to strengthen and improve health services in Kenya.

Remember, you don't have to talk about anything you don't want to and you may end the interview at any time.

This interview will not take too much time (around 1-2 hours). If you have questions you want to ask on other topics, I can assist you to find answers after the interview is over.

(Read the informed consent form for in-depth interview participants out loud and give the participant a copy. If she agrees to participate, ask her to sign the informed consent form. This guide includes the topics to be covered and questions that may be helpful in facilitating the interview. You do NOT have to ask all the questions or follow the order given in the guide.)

A. In-depth interview topics with relevant probes

We want to know how your life is. How did you begin your day, what time did you wake up? In the last 2 months, **tell us about the various ways you use water, starting with when you wake up.**

How is majority of water acquired

Do you think water from these sources is safe?

How is water used? What are the top three uses of water in your household? Who decides how water is used?

Division of labor- who does which water-intensive chores?

Who makes sure there is enough water for household chores? For cooking? For the animals or for agriculture?

What do you do/another job? What happens to your work while fetching water? Can you afford time off?

Do children help in collecting water? What time of the day are they likely to be engaged? What about those going to school?

Changes in **your household's water access**

Fluctuations by month (query on major months of rainfall, harvests, labor, illness (eg. malaria), food insecurity, skinniness)

While pregnant (what were some of the causes?)

While lactating (what were some of the causes?)

Changes in **your personal water use** (increase, decrease etc.)

During pregnancy— why (availability, preference, taboo, change in HH composition, etc.)?

During lactation — why (availability, preference, taboo, change in HH composition, etc.)?

Other health conditions affecting water use?

Do you **know women** who are having problems with enough water in the house? What do you think the consequences are?

Probe on: Nutritional consequences

Health consequences

Other health issues (HIV)
Depression, stress, anxiety
Agricultural or livestock issues
Personal hygiene
Changes in other livelihood behaviors, e.g. employment, bartering, selling items, sexual risk behaviors?

Do these problems with water we discussed above change somehow during pregnancy? How?

When **you were/now that you are pregnant** did you have any of these kinds of problems?

Could you describe them?
Was it because of issues with water?
Was it because of other things? Like what?
How do you cope with any of the water problems you mentioned above? (prompt with behavior change, diet change, strategies for increasing water, e.g. using your phone to get water, borrowing water, using credit, decreasing # of people in HH, rationing water¹)

Think about the **women with children < 1 year you know** who are having problems with enough water in the house. Do you think water problems are causing

Problems caring for their infant- like how?
Health problems for the children—like what?
Problems with feeding the infant feeding? Like how?
Problems with keeping the household clean?
Problems keeping themselves or their household members clean?
Psychological problems, like stress or depression.
Economic problems? How so

When **your child was <1 year**, did you have similar problems?

Could you describe them?
Was it because of issues with water?
Was it because of other things? Like what?
How do you cope with any of the problems described above?

What are your **sources of support** generally? Do you know of any services, government initiatives, programs or clubs who help support getting water?

For HIV-infected women only: Could you describe how HIV has affected your water situation?

What do you think would help you to have less worries about water?

Support from family or friends
Change in employment
Better Climate
Control of money
More land
Etc.

What do you think would limit you from having enough water for your use?

Livestock needs
Agricultural activities
Community dynamics (coming from another clan/village)

¹ Source: Maxwell, D. and Caldwell, R. 2008 Coping Strategies Index: Field Manual Guide. World Food Program

B. Review water sources:

- Distance to each water source in minutes and kilometers
- Mode of collecting water from each source, transportation used
- Person who typically collects water
- Containers used, including their capacity
- Use for that particular water
- Treatment of water if any

C. Demographics

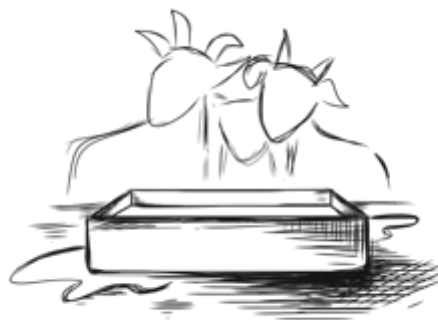
- Age (Date of Birth)
- Parity/living children
- Pregnant/lactating, gestational/infant age
- Education
- Marital status, co-wives (rank)
- Religion
- Ages and relationship of those you live with and share meals
- Village
- Ethnicity
- HIV status
- ART use
- Phone number

D. Now, I would like to accompany you to fetch water from all of the places that you normally get it. Can we do that? Would you mind if I took photos of the places and of yourself?

I would appreciate if I can filter approximately 10 liters of water so that we can take a small portion to test the safety of the water. Would that be alright with you?

Observational points: What does the environment look like? Who is also in the area? What are the possible health hazards?

Supplemental Material 2: Thematic Sorting Illustrations



Supplemental Material 3: Photovoice Guide

PHOTOVOICE ENROLLMENT, VISIT 1

Materials: consent form; camera

Introduction:

Read the informed consent form for the photovoice interview out loud and give the participant a copy. If she agrees to participate, ask her to sign the informed consent form. Complete the Participant Characteristics Form and the introductions part of the discussion. This guide includes the topics to be covered and questions that may be helpful in facilitating the interview. You do NOT have to ask all the questions or follow the order given in the guide.

- ☐ Explain the reason we want women to take photos.
- ☐ Explain that a copy of the photos will be made for the participant to pick up during the group discussion.
- ☐ Remind her that her privacy is important, and we will remove any identifying information in the photographs if she wants.
- ☐ Explain the group discussion with other participants. Those people will get to see certain photos that the participant takes. We won't share any photos she doesn't want us to share.
- ☐ Ask if we can take one picture of the mother with her camera.

Camera instructions:

- ☐ Give her the camera and explain how to take a photograph.
- ☐ Have the mother take some pictures with the test camera so that you're sure she knows how it works.

Central topic to take pictures of: Household water acquisition and use.

Interview questions at visit 1:

1. How do you and your household members **acquire** water? What influences this?
(Prompt participant about other people, village dynamics, costs, policies, laws, climate, etc.)

2. How do you and your household members **use** water? What **influences** this?

(Prompt participant about agricultural and economic uses, food preparation and drinking purposes, washing and sanitation purposes, and any other ones.)

Remind the participant that she should take all 30 photos in 3 days. Date: _____

PHOTOVOICE FOLLOW UP INTERVIEW, VISIT 2

Thank you for your participation in this study. Remember, you don't have to talk about anything you don't want to and you may end the interview at any time.

(Ask permission to tape record the discussion, and if she agrees, start the tape recorder AFTER the introductions part of the discussion. This guide includes the topics to be covered and questions that may be helpful in facilitating the interview. You do NOT have to ask all the questions or follow the order given in the guide.)

Materials: computer, cord attachment for camera, voice recorder

Interview Questions: (make sure recorder is on)

1. Please describe this photo #X (go through each one of them). Say the number aloud.
2. Why did you take a picture of it?

Probes about things not in the pictures:

3. Are there other people who influence how your household obtains and uses water who you didn't have the chance to take a picture of?
4. Do you or your household get or use water for other purposes, but that you couldn't photograph?
5. Are there certain seasons that influence how you feed your baby but that you couldn't take a picture of?
6. IF there were no pictures of this: Does your own health influence how you get and use water?
7. Overall, what did you think of this photography activity? Why?
8. Do you have enough water for your household needs? Why or why not?
9. Which photos are most important [that we should include in the group discussion]?

Talk to the mother about the group discussion. Ask her if she will be able to attend on the designated date, and remind her that she will get a transportation refund and a copy of her photographs.

Group Discussion Date: ____/____/____

Which photos did she select for group discussion?

PHOTOVOICE FOLLOW UP INTERVIEW, VISIT 3

Materials: copies of selected photos from each woman's camera; photograph of each woman with certificate of completion; voice recorder; notebook; refreshments

Introduction:

- ☐ Remind women why we had asked them to participate in this project, and remind them that what they say is confidential.
- ☐ Tell them that we would like to have a group discussion about the photos they took. We think their opinions are valuable, and we would like the participants to share their experiences with each other so we can see where they are similar or different.

Group Discussion Questions: (make sure recorder is on)

The question you answered with your photographs is "What are ways you and your household members acquire and use water? What influences how you get and use water?"

1. To each woman: Explain 2 of your photographs and tell us how each one relates to this question.
2. Based on your photographs and experience, what are the most common reasons for not having enough water?
3. What do you think are the biggest causes of the problem of not having enough water?
4. What do you all usually do when you don't have enough water?
5. How do you think this problem can be fixed?
6. Who would you like to know about the information you are giving us? Would you like someone else to see these photos?
7. Ask if we can post pictures to a website.

Take notes in notebook for participants to look at during the discussion, so they can see what themes they have agreed on, along with a list of things they may like us to do with their photographs.

Supplemental Material 4: Coding Tree

1. Great Quotes
2. Cost
3. Safe water/water quality
 - a. Cooking
 - b. Bathing
 - i. Husband
 - ii. Child
 - iii. Mother
 - c. Drinking
 - i. Husband
 - ii. Child
 - iii. Mother
 - d. Diseases
 - i. Rashes
 - ii. Malaria
 - iii. Cholera
 - iv. Typhoid
 - v. Vomit
 - vi. Diarrhea
 - e. Water treatment
 - i. Chemical (i.e. Waterguard, chlorine)
 - ii. Boiling
 - iii. Filtration
 - iv. Untreated
 - v. Cost of water treatment
 - f. Government interventions to treat water
 - g. Unsafe water source (Water source is perceived as unsafe due to environmental causes (buses, snakes, etc.), biological hazards (bacteria, etc.) or other reasons)
4. Water prioritizing
 - a. Sanitation
 - b. Cooking
 - c. Drinking
 - d. Bathing
 - i. Husband
 - ii. Child
 - iii. Mother
 - e. Household cleaning
 - f. Washing clothes
5. Decision of water use
 - a. Men
 - b. Women
 - c. Mother
 - d. Husband
 - e. Child
6. Amount of water
 - a. <5L
 - b. 5-10L

- c. 11-15L
 - d. 16-20L
 - e. >20L
- 7. Questions about water testing
- 8. Increase in need for water
- 9. Water storage
 - a. Tanks
 - b. Jerrycans
- 10. Consequences of water unavailability (Includes illness (humans/animals), impacts on hygiene, economic impacts, disruption of household activities)
 - a. Who water unavailability impacts
 - i. Mother
 - ii. Women
 - iii. Men
 - iv. Child
 - v. Husband
 - b. Food prices
 - i. Increase
 - ii. Decrease
 - c. Economic costs (financial costs associated with not having enough water)
 - d. Poor hygiene (Bathing, washing clothes, washing hands, washing faces, brushing teeth)
 - i. Husband
 - ii. Mother
 - iii. Child
 - e. Impact on crops
 - f. Getting water from another source (Further away, less safe, or not as acceptable source)
 - g. Household cleanliness (Not able to wash clothes, clean home, wash baby, etc.)
 - h. Drinking (Not enough water for drinking in household)
 - i. Worry/anxiety about water
 - j. Animals dying/suffering (Animals suffering as a consequence of water unavailability)
 - k. Changing foods cooked (Changing foods being cooked as a consequence of water unavailability)
 - l. Diseases (Diseases as a consequence of water unavailability)
 - m. Economic activities (Economic activities that are impacted by water unavailability)
 - i. Cannot keep animals
 - ii. Cannot do work
 - 1. Women
 - 2. Men
 - 3. Husband
 - 4. Mother
 - n. Shame
 - o. Stigma
 - p. Disruption of food source (i.e. cannot eat if there is not water, cannot cook, cannot prepare food)
 - q. Dehydration
- 11. Response to water shortage (Any response to household water or water source shortages- either a participant's response to own water shortages, or response to others' water shortages)
 - a. Storage
 - i. Water tanks
 - ii. Water containers/Jerrycans
 - b. Alternative sources
 - i. Piped water
 - ii. Surface water
 - iii. Borehole/well

- iv. Purchased water (Includes bottles, bags, and other containers of treated or untreated water)
 - v. Rainwater
 - vi. River
 - c. Institutional response
 - i. Government Interventions
 - ii. Private
 - iii. NGO interventions
 - d. Borrowing water
 - i. From neighbors
 - ii. From landlord
 - iii. From family members
 - e. Loaning water
 - i. To neighbors
 - ii. To family members
 - iii. To households with insufficient access/supply
 - f. Water sparing
 - g. Water rationing
 - h. Irregular water collection hours (Collecting water at an irregular time due to water shortage (i.e. waking up to get water at 3am))
 - i. Change in who collects water
- 12. Social dynamics (Any social dynamics around water acquisition, use, or lack)
 - a. Thieving
 - b. Violence
 - c. Male expectations
 - d. Quarrelling
 - e. Informal governance (Community-led governing of water source or moderating of water sources)
 - f. Community level (Anything related to intrapersonal dynamics within the community, either in water use, acquisition, etc.)
 - i. Social relations
 - ii. Between women
 - iii. Between family members
- 13. Gendered responses (Responses specific to males and/or females)
 - a. Male
 - b. Female
- 14. Water acquisition
 - a. Primary source (Main source of water for the household)
 - i. River
 - ii. Borehole/well
 - iii. Tap
 - iv. Surface water
 - v. Rainwater
 - vi. Tank
 - b. Labor
 - i. Means of carrying water
 - c. Capacity/quantity
 - d. Limitations/barriers to water acquisition and carrying
 - e. Secondary source (Alternative sources other than the primary source)
 - i. Rainwater
 - ii. Tap
 - iii. Borehole/well
 - iv. Surface water
 - v. River

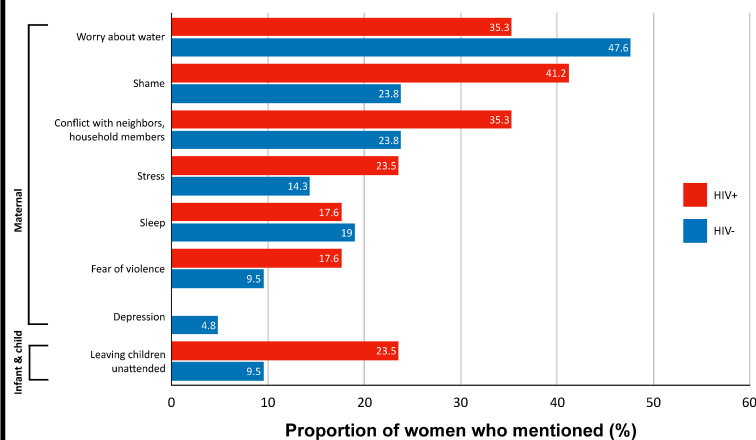
- f. Workload (Includes drawing and carrying water)
 - g. Distance
 - h. Means of collecting water (Pulling using a rope, hand pump, scooping)
 - i. Motor pump/electric pump
 - ii. Rope and pulley
 - iii. Hand pump
 - iv. Scooping
 - i. Cost
 - j. Waiting/queuing time (Time taken queuing for water)
 - k. Responsibility
 - i. Mother
 - ii. Women
 - iii. Husband
 - iv. Child
 - v. Men
 - l. Storage
15. Water use (Includes both human household activities, field, agricultural, and animal uses)
- a. Garden/crops
 - i. Quantity
 - ii. Source
 - b. Household cleaning
 - c. Floor sweeping, mopping, smearing dung, sprinkling water
 - d. Utensils/dishes
 - e. Bodily hygiene
 - i. Brushing teeth
 - 1. Child
 - 2. Husband
 - 3. Mother
 - ii. Bathing
 - 1. Child
 - 2. Husband
 - 3. Mother
 - 4. River
 - iii. Hand washing
 - 1. Husband
 - 2. Child
 - 3. Mother
 - iv. Cleaning face
 - 1. Husband
 - 2. Child
 - 3. Mother
 - v. During menstruation
 - f. Washing clothes
 - i. Husband
 - ii. Mother
 - iii. Child
 - iv. Mother-in-law
 - g. Sanitation
 - i. Washing/using toilet
 - h. Others
 - i. Construction
 - ii. Manufacturing
 - iii. Washing vehicles (As an economic activity-washing cars, motorbikes, etc.)

- iv. Flourmill
 - v. Washing chairs
 - vi. Weaning
 - vii. Salon
 - viii. Cleaning gold
 - i. Drinking
 - j. Animals/Livestock
 - i. Cattle
 - ii. Birds (Chickens, guinea fowl, ducks, turkeys, etc.)
 - iii. Goats/sheep
 - iv. Rabbits
 - v. Fish
 - vi. Cleaning/milking
 - k. Labor/time spent on water-related activities (Labor associated with water use (i.e. washing clothes), distinct from labor associated with water acquisition, can include helping with household chores)
 - i. Child
 - ii. Mother
 - iii. Father/Husband
 - l. Perceptions of-/satisfaction with water source
 - m. Food preparation
 - i. Soaking food
 - ii. Cooking (Tea, ugali, porridge, stew, etc.)
 - iii. Washing foods (Any food items: vegetables, meat, etc.)
 - iv. Making tea
 - n. Taking medications
16. Food/Crops, not related to water, but possibly relevant later
17. Quotes (Quotes from participants that are informative of the work, either positively or negatively.)
18. Surprising Finds/Not previously considered
- a. Wild plants for food
19. Qualifiers
- a. Done
 - b. Speculated
 - c. Observed
20. Causes of limited water availability (Includes physical, ecological, political or economic causes)
- a. Illness
 - i. Child
 - ii. Mother
 - iii. Husband
 - iv. Relative
 - b. Epidemic (such as cholera)
 - c. Workload
 - d. Number of household members
 - e. Time to travel to source
 - f. Government advisories (Cholera advisories, etc.)
 - g. Cost
 - h. Lack of storage
 - i. Pregnancy limits
 - j. Seasonality/climate
21. Consequences of fetching water (Includes safety, time and physical burdens, negative health impacts, burdens on children, etc.)
- a. Maternal condition (Pregnant or lactating)
 - i. Pregnancy

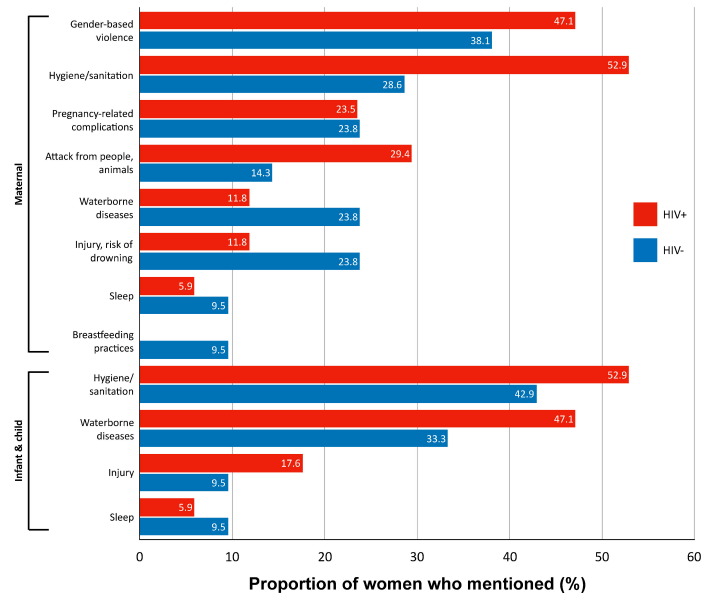
- ii. Lactation/breastfeeding
- b. Purchasing (cost, means, paying to fetch/gather water)
- c. Missing school (forgoing school to fetch water)
 - i. Children
- d. Disruption of normal household activities (Disruption of cooking, cleaning, etc.)
- e. Falling into water source (Falling into the source while fetching water)
- f. Hunger (Hunger as a consequence of fetching)
 - i. Father/husband
 - ii. Mother
 - iii. Child
- g. Insecurity (Any insecurity experienced as a consequence of fetching water)
 - i. Animals that may be dangerous (e.g. snakes, crocodiles, etc.)
 - ii. Being attacked (Being attacked as a consequence of fetching water)
 - iii. Thieves breaking into house
- h. Negative impacts on health
 - i. No cooking
 - j. No firewood
 - k. No play
 - i. Children
 - l. Sleep deprivation
 - m. No vegetables
 - n. Time spent waiting
 - i. Father
 - ii. Mother
 - iii. Child
 - o. Interference with work/livelihood (Delay going to work to get water, leaving work, etc.)
- 22. Coping mechanisms
 - a. Recycling water

Supplemental Material 5: Experiences of Water Insecurity by HIV Status

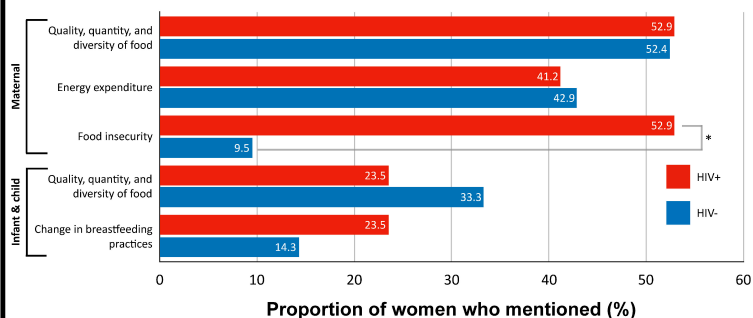
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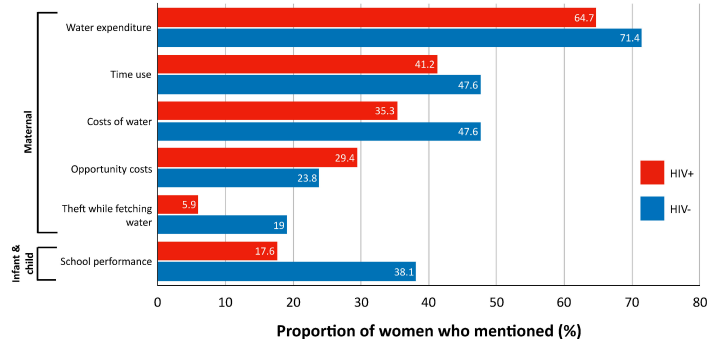
PHYSICAL



NUTRITION



ECONOMIC



* $p < 0.05$

† Analyses conducted using chi-square and Fisher's exact